

JAN 3 1986

NE-23

Designation Survey - Palmerton, Pa. Ore Storage Site

William Bibb  
Oak Ridge Operations Office

Based on the information furnished in Aerospace's Summary and Authority Review of the subject site (Attachment 1) and the recommendation by ORNL/RASA (Attachment 2), it is requested that ORNL/RASA conduct a designation survey of the Palmerton Ore Storage Site at Palmerton, Pennsylvania. The survey should be detailed to furnish sufficient surface and subsurface data to make up for the lack of sufficient information in the previous AEC surveys and in keeping with our current guidelines. The ORNL/RASA group should furnish a draft survey plan to this office for approval prior to conducting any survey activities.

If there are any questions, please call Edward DeLaney on FTS 233-4716.

Arthur J. Whitman  
Division of Facility and Site  
Decommissioning Projects  
Office of Nuclear Energy

## 2 Attachments

bcc:

E. Keller, OR, w/attachs.  
B. Berven, ORNL, w/o attachs.  
J. Berger, ORAU  
A. Whitman, NE-23

Aerospace

Baublitz RF  
Whitman RF.  
NEG (4)

NE-23:AWhitman:ph:353-5439:12/30/85:IBM:364/52:3.38.5

CONCURRENCES	
RTG SYMBOL	NE-23
INITIALS/SIG.	Whitman
DATE	12/31/85
RTG SYMBOL	NE-23
INITIALS/SIG.	DeLaney
DATE	12/31/85
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OAK RIDGE NATIONAL LABORATORY

OPERATED BY MARTIN MARIETTA ENERGY SYSTEMS, INC.

POST OFFICE BOX X  
OAK RIDGE, TENNESSEE 37831

September 30, 1985

Mr. A. J. Whitman, NE-23  
Division of Facility & Site  
Decommissioning Projects  
U. S. Department of Energy  
Germantown, Maryland 20545

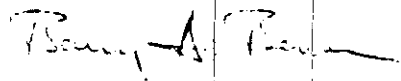
Dear Mr. Whitman:

Review of Aerospace's Summary and Authority Review for the Palmerton,  
Pennsylvania Ore Storage Site

We have reviewed Aerospace's report, "Summary and Authority Review for the Palmerton, PA Ore Storage Site." Based on post-remedial action survey performed by J. W. Gabelman, AEC (correspondence to R. D. Niniger, Oct. 1, 1973), it appears that residual radioactive material was left following remedial action. Due to the lack of detailed radiological data in this report, it is uncertain as to whether the radiation levels presently existing on this site would meet the FUSRAP criteria for release.

It is recommended that this site be the subject of a designation radiological survey. It should be noted that because the residual material is subsurface, a more detailed designation survey (probably to include drilling and subsurface soil analysis) will be required to provide sufficient information to designate or exclude this site from further remedial action.

Sincerely yours,



Barry A. Berven, Ph.D.  
RASA Program Manager, ORNL

BAB:sh

cc: R. O. Chester  
W. D. Cottrell  
E. Delaney, DOE/HQ  
S. V. Kaye  
A. Wallo, Aerospace

*Attach. 2*

SUMMARY AND PRELIMINARY AUTHORITY ANALYSIS  
FOR THE ORE STORAGE SITE IN  
PALMERTON, PENNSYLVANIA

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Attach. 1

# DRAFT

## SUMMARY ON THE ORE STORAGE SITE IN PENNSYLVANIA

### Introduction

This report summarizes Atomic Energy Commission activities at a site used for the storage of AEC owned ore near Palmerton, Pennsylvania. The report also includes an authority analysis and assessment of the site's radiological history. The purpose of this report is to provide the Department of Energy information on which to base a decision as to whether the site should be considered for the FUSRAP radiological survey program.

The data summarized herein is based upon information assembled during reviews of AEC Raw Materials Division (DRM) records and through interviews with former AEC employees involved in the operations. Most of the material pertinent to this investigation are included in Appendices 1 and 2. While some additional records, still classified, exist in the DRM files and are not included in this report, these records provide no more information than is available from the records provided in the appendices.

### Background

During the early 1950's the AEC Division of Raw Materials was implementing a program to identify potential sources of domestic uranium and to encourage commercial mining of uranium ore. Lehigh Coal and Navigation Company contacted the AEC in 1951 to obtain assistance and guidance with regard to the mining of uranium deposits located on their property in Mauch Chunk (Jim Thorpe), Carbon County, Pennsylvania. Samples of ore from this deposit were found to contain uranium oxide in concentrations as high as 3% but generally less than 1%. The ore was a low vanadium content carnotite type ore and documentation in 1951 indicated that Lehigh had mined about 10 to 12 tons of 0.4 to 0.5 % uranium grade ore for developmental purposes. Over the next two years with the assistance of the AEC, Lehigh conducted additional developmental mining, but, most ore assayed at less than 0.1% uranium oxide.

Between 1953 and 1954, to support the development of eastern uranium mines and to meet the AEC's goals for procurement and stockpiling of uranium ore, the Division of Raw Materials established an ore stockpile on the property of New Jersey Zinc Company at their smelter and research center in Palmerton, Pennsylvania. Figure 1 shows the location of the Mauch Chunk, also known as Jim Thorpe, area with respect to the Palmerton area and Figure 2 is a more detailed map of the Palmerton area. The actual location of the stockpile within the Palmerton area has not yet been determined. It was probably located on the east side of town in the large industrial area shown in the figure.

The AEC stored about 57 truckloads of ore (about 360 tons) from Lehigh Coal and Navigation Company at the site. The ore averaged about 0.21% uranium oxide. New Jersey Zinc accepted, sampled, and stored the ore as an agent of the AEC. The ore was stored on this property (leased to the Federal government) until 1973.

In 1972 and 1973, as a indirect result of the Grand Junction mill tailings legislation, the AEC initiated a program to evaluate and, where appropriate, clean-up AEC ore storage or stockpile locations.

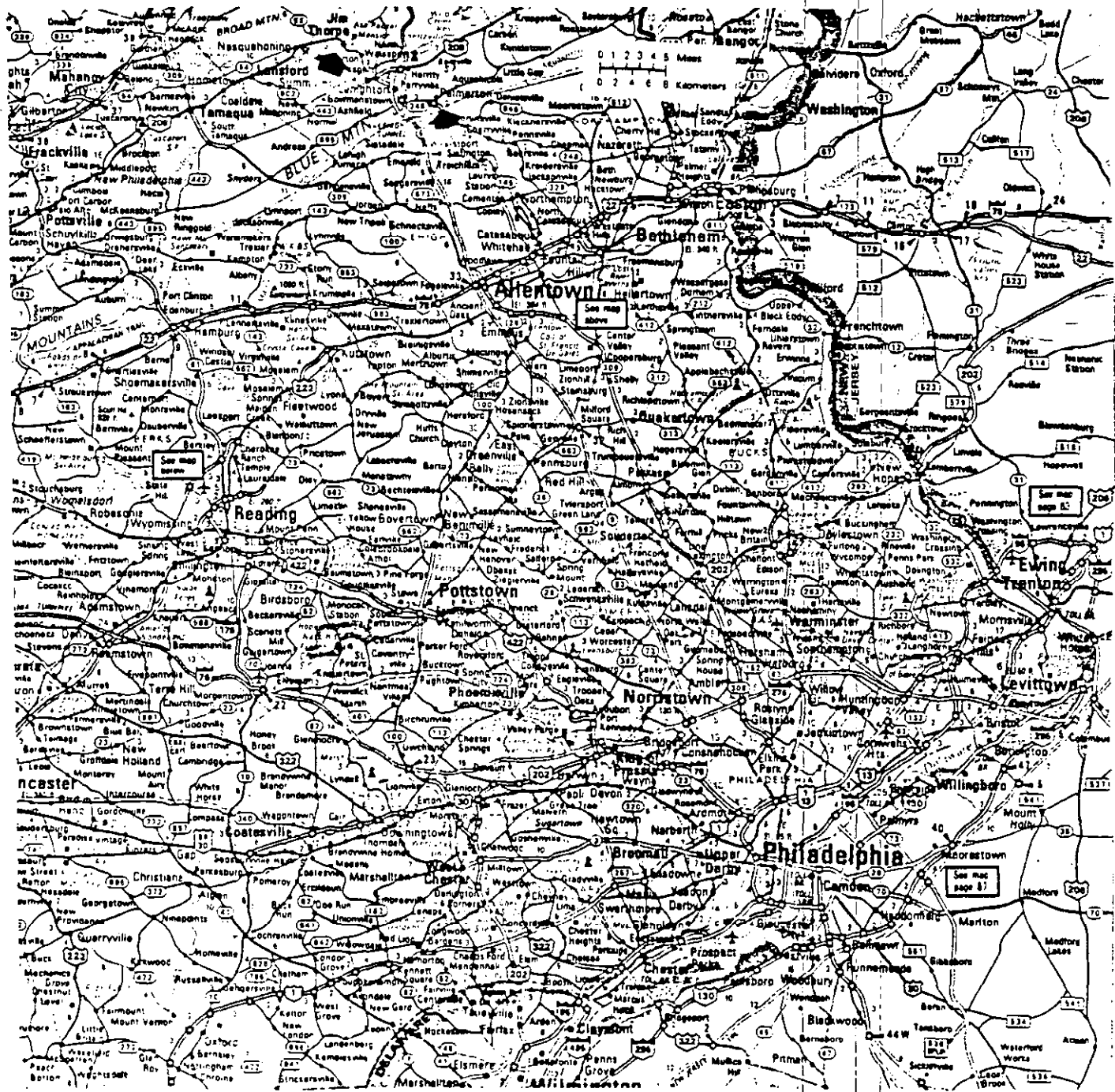


Figure 1. Location of Palmerton and Jim Thorpe

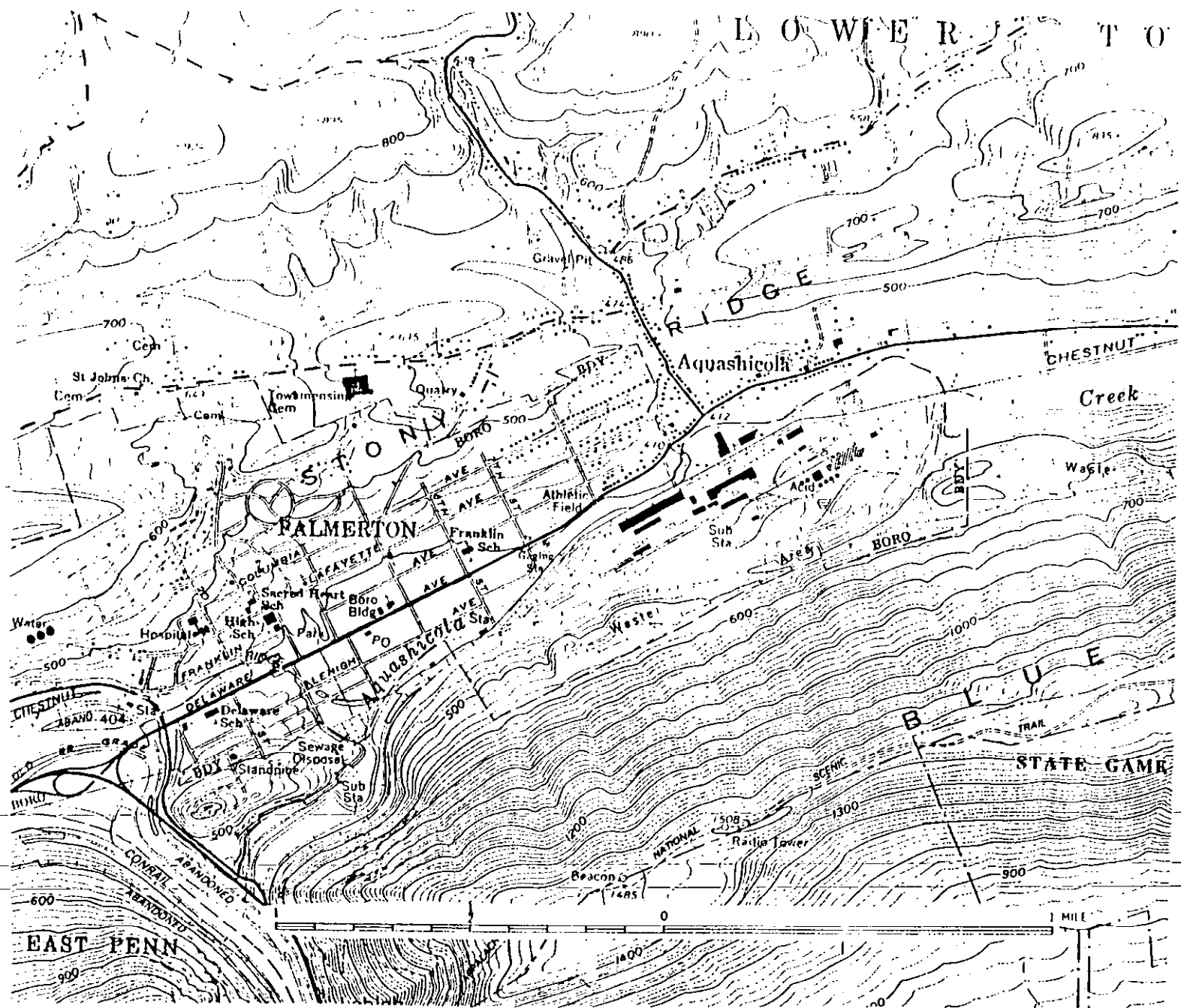


Figure 2. Palmerton, Pennsylvania Area Map

The AEC considered all former AEC ore storage and stockpile locations and determined that, of the approximately 18 sites formerly leased and used by the Commission, 4 would require clean-up by the AEC at that time. The AEC accepted responsibility for these formerly leased sites because they were used only for the purchase or storage of ore for the AEC and because, unlike many of the other sites, they were not connected with the operation of a commercial mill. The Palmerton site and three western sites were included in this clean-up effort. The site was visited by AEC personnel in January of 1973 for the purposes of characterizing the condition of the site and the material, and identifying options for disposal of the ore. The survey data indicated that the average external exposure gamma rates over the pile were slightly less than 1 mR/hr and peak measurements were on the order of several mR/hr. At 200 feet and 600 feet, respectively, from the pile gamma rates were about 15 and 7.5 microR/hr. Several options for disposal of the material on the site were considered, they ranged from shipment to a processing site to efforts to dispose of the ore locally. The final AEC decision was to remove the material from the New Jersey Zinc property and ship it to the AEC Feed Materials Processing Center in Fernald, Ohio for disposal in the plants raffinate pits.

The ore was removed from the site in June of 1973 in six gondola cars. The AEC arbitrarily set the maximum acceptable residual radioactivity level at 40 microR/hour above background (20 microR/hour). The AEC plan initially called for the removal of 6 inches of soil below the ore, this material was loaded into the railroad cars and shipped to Ohio with the ore. Some chunks of ore were inadvertently buried during removal operations and some additional soil had to be excavated. The area at the east end of the stockpile was excavated an additional 2 to 2.5 feet to ensure that all the chunks of ore were removed. This material was disposed of on site in the New Jersey Zinc slag dump. The residue was rolled down a 100 foot slope in the dump. At that time the company was dumping about 50 railroad cars of slag per day in that area. New Jersey Zinc presented the Grand Junction office with an invoice for the cost of the disposal operation following the post-removal survey. Any additional charges were to be covered under a second purchase order. These purchase orders have not been located. They were apparently destroyed in accordance with standard records management schedules.

The post-removal survey completed in July 1973 found all areas of the site within the 60 microR/hour level (40+20). Figure 3 is an isorad map of the area prior to backfilling. One radon sample taken during the post-removal survey measured 6.4 pCi/l or about 20 times background (.29 pCi/l). This was in excess of both the initial radon guidelines (2 times background) and the final guideline (changed to 2.5 times background). Additional samples and measurements were taken later in the year (September 1973) at background locations and at the site after backfilling was completed. Measurements at the background location indicated higher background radon levels (1.6 pCi/l), while the measurements at the site produced lower radon concentrations (0.5 pCi/l) in the area that indicated high radon levels in the July survey. The radon levels in that area were actually found to be below the newly measured background.

concentrations. External gamma measurements in the areas excavated and backfilled and around the railroad track averaged less than 8 microR/hour with the maximum being less than 11 microR/hour. On the basis of the second set of measurements and because all the gamma measurements were within the guideline adopted by the AEC, the action was considered by the Division of Raw Materials and the Division of Operational Safety to be within the defined criteria. Therefore, the site was considered acceptable for release to the owner.

During shipment of the ore to Fernald, Ohio, the top rail on one of the six cars broke and caused a minor spill. The ore was reloaded into another car and the broken car was washed down before repair. The car and the site of the accident were examined by AEC personnel and surveyed. No readings in excess of 1.5 times background were measured. The AEC also monitored the transfer of the material between the cars as well as the washing of the equipment used to transfer the ore between cars.

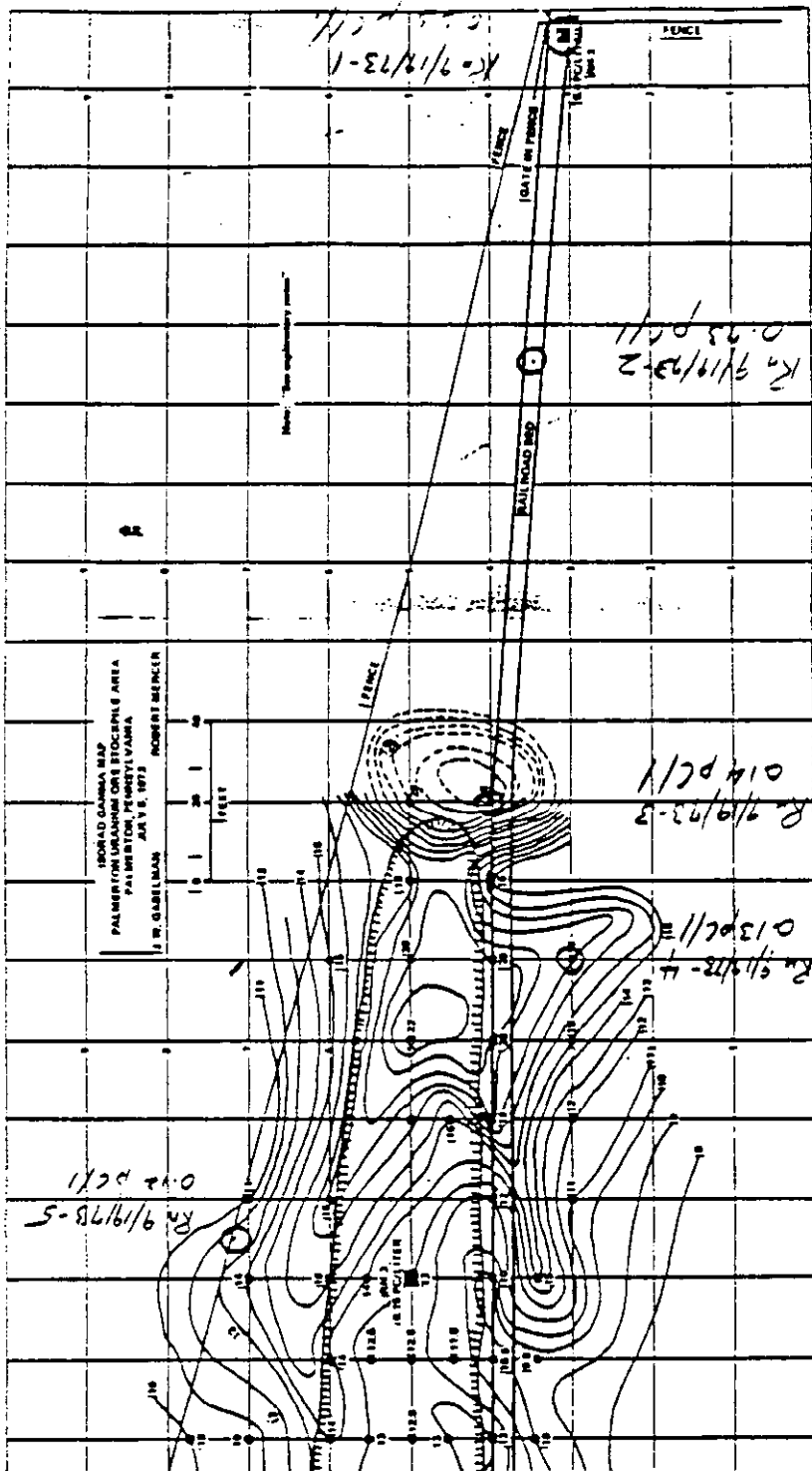
#### Site Description and Ownership

The storage area was located in the Palmerton, Pennsylvania area on New Jersey Zinc, Inc. property. Figure 3 (isograd map) shows the storage area. New Jersey Zinc has plants on the west and east sides of Palmerton and offices at Fourth and Delaware in Palmerton. The storage site was located at the East Plant near the zinc smelter and research center. The actual location of the storage site and the plant has not yet been determined. No contact with the company has officially been made.

#### Authority Analysis

The determination of authority for remedial action at a candidate FUSRAP site is based upon an evaluation of the operations conducted at that site, and AEC's association with the site considering contractual, and operational relationships and health and safety responsibilities. The Department's authority (excepting mandated actions) for remedial action is through the Atomic Energy Act of 1954 as amended. Using all information available, DOE evaluates each site individually. Five questions developed with the assistance of the Department's Office of General Counsel are used to guide the evaluations and to assist in determining if there is sufficient evidence to determine if DOE has authority for remedial action at the site and to include the site in FUSRAP (if remedial action is needed). These five questions are addressed below.

- 1) Was the site/operation owned by a DOE predecessor or did a DOE predecessor have significant control over the site?
- The site was leased by the AEC from New Jersey Zinc Company for storage of uranium ore. The ore was the property of the AEC. However, except for the removal and cleanup operations the site was under control of the New Jersey Zinc Company who was acting as an agent for the AEC.



- 2) Was a DOE predecessor agency responsible for maintaining or ensuring the environmental integrity of the site (i.e., were they responsible for cleanup)?

- Based on a limited amount of historical information, it appears that there was minimal maintenance of the stock pile. The material was stored in uncovered piles within the fenced area of the New Jersey Zinc property between the fence and the railroad.

AEC was responsible for the cleanup action. New Jersey Zinc was paid to perform the physical removal and final decontamination and limited disposal (some of the residue from the secondary clean-up was disposed of on the company's property). Most of the material was shipped by the AEC to an AEC site for disposal. AEC personnel were in charge of the cleanup, they supplied the health physics coverage and dictated the limits of the cleanup as well as prescribing the radiological criteria (40 microR/hour above background). AEC personnel also monitored the loading of the gondola rail cars and followed up on the shipping accident which occurred while the material was enroute to Ohio.

- 3) Is the waste, residue or radioactive material on site the result of DOE predecessor related operations?

- Additional radiological survey work would be required to properly respond to this question. However, based on the historical records and survey data, some of the AEC material remains on the site.

- 4) Is the site in need of further cleanup and was the site left in a non-acceptable radiological condition as a result of DOE predecessor related activities?

- The 1973 correspondence states that the site conformed to the criteria established for the site at that time. However, it cannot be determined from the data whether or not the site would meet present day criteria. Additional survey data would be required to make such a determination.

- 5) Did the present owner accept responsibility for the site with the knowledge of its contaminated condition and that additional remedial measures would be needed to make the site acceptable for unrestricted use by the general public?

- The owner was involved in the final site cleanup action in 1973. The company was told by the AEC that the site was in a condition that was acceptable for unrestricted use following the completion of the action. The company depended on the the AEC criteria or guidance, and surveys regarding health and safety matters.

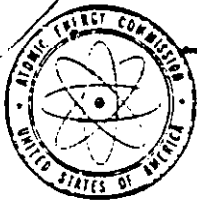
## Findings and Recommendations

- 1 In general, it would appear, that because AEC was totally responsible for funding, directing and verifying the decontamination of this site, and because they previously determined that authority existed for the initial cleanup, the Department should have authority under the Atomic Energy Action of 1954 as amended to conduct any additional required action at this site.
- 2 While the final report for the site clean-up indicates that the site met criteria (established at that time), the supporting radiological data is not sufficient to demonstrate that these standards were met everywhere on the site nor is it sufficient to determine if current FUSRAP standards are met.
- 3 It is recommended that this site be considered for a screening survey to determine if further remedial action is warranted. It is also recommended that, prior to the screening activity, ORNL be requested to review the attached radiological data to determine if they concur that more information is required or if they believe that there is sufficient data to eliminate the site from FUSRAP.

DRAFT

APPENDIX 1

Reports & Correspondence on  
AEC Clean-up of Storage Site



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

October 1, 1973

Robert D. Nininger  
Asst. Dir. for Raw Materials  
Div. of Production and Materials Management

RESTORAL OF PALMERTON ORE STORAGE SITE -- FINAL ACTIVITIES

Introduction

The restored ore storage site at the East Plant of the New Jersey Zinc Company, Palmerton, Pa., was visited September 18 and 19 for final sampling of gamma radioactivity and radon 3 months after the ore was removed and 8 to 10 weeks after the stripped storage area had been backfilled with slag. Please refer to memoranda of 1/29/73, 6/7/73, 6/15/73, and 8/28/73 for background.

Summary and Conclusions

Gamma activity and radon levels in the area and surroundings are below the maxima of 60 microroentgens gamma and 2-1/2 times the 9/19/73 background radon, standards set by Division of Operational Safety. The site is deemed to be not hazardous and it is recommended that this case be closed.

Gamma Radioactivity

Enclosure "C" (Isorad Map of the Stockpile Area) of the 8/28/73 memorandum could not be included with that memorandum because of drafting delays, and is enclosed herewith. This map portrays gamma activity and radon levels at the site prior to backfilling with slag. For the 9/19/73 survey, the grid of the 7/5/73 survey was not duplicated because all the original readings were below the allowable maximum. Instead the minimum, maximum, and average gamma values were determined for the filled area and for the railroad bed which had not been disturbed.

Gamma Counts Per Second (Micro R/hr.)

	<u>Minimum</u>	<u>Maximum</u>	<u>Average</u>
Filled Area	52 (6.9)	72 (9.5)	58 (7.7)
Railroad Bed	40 (5.3)	80 (10.6)	60 (7.9)

Mt. Sopris Scintillation Counter

October 1, 1973

This unusually low radioactivity is attributed to the cover of slag which is much lower than that of average soil. The gamma background in Palmerton City Park is 90 (11).

#### Radon

The locations and radon concentrations of the radon samples taken 7/5/73 are shown on 8/28/73 enclosure "C". The locations and radon concentrations of the samples taken 9/19/73 have been added in red. The results of analyses are reported in enclosure A. Not shown are the July and September samples taken for background at the same spot in Palmerton City Park. The 7/5/73 background sample of 0.29 pc/liter compares with 1.6 pc/liter 9/19/73. The later, 5.5 times higher, may represent a normal cyclic change in the exhalation from the black soil of the park, or may result from something added to the soil during a carnival which was closing at the time of the second sample. The former is more probable and would illustrate a large variation of radon background as we found in Louisiana. At any rate, the later sample establishes a new background of acceptability for the stockpile site radon levels.

The highest level of 6.4 pc/liter at the railroad gate 7/5/73, which was 20 times background at the time, is only 4 times the new background. However, the 9/19/73 sample at the identical spot at the railroad gate is now only 0.53 pc/liter, less than the later background. It is therefore acceptable. The former high value may have been in error due to a misplaced decimal (the new value is about 10 times less), but the latest value is still comparatively high and an anomaly may have and might still exist. Sample 9/19/73-2 exhibits the highest level found in the stockpile area, and is 80 feet closer to the more radioactive east end of the pile area. The radon levels in the backfilled area are still consistently lowest.

As one logical explanation for the anomalies, the periphery of the pile area (particularly the railroad bed) was not excavated and backfilled, and is known to have received some uranium daughters from leaching of the pile. A few pieces of ore may still be buried in this ring area. Radon could emanate through the surficial slag and enter the atmosphere to be blown downwind. A common wind direction is from the northwest or west. Radon thus blown may accumulate against the barrier created by the solid board fence. However, the variations in the anomaly near the gate are well within the natural variation found in Louisiana where no uranium ore was known on the surface.

The radon data suggest a natural variation of about one order of magnitude at any locality. Accepting this variation as fact, it is apparent that the acceptable anomaly limit of twice background is

R. D. Nininger

3

October 1, 1973

unrealistic and could not even be ascertained without measurements over enough time to establish an accurate average.

*John W. Gabelman*  
John W. Gabelman  
Staff Geologist  
Division of Production  
and Materials Management

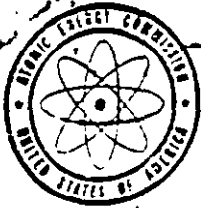
PMM:JWG

Enclosures:

1. Attachment 8/28/73-C  
Isorad Map of the Stockpile Area
2. Attachment 9/25/73-A  
Report of Radon Analyses

cc:

F. K. Pittman, WMT  
R. J. Catlin, EA  
R. E. Allen, OS  
B. M. Robinson, OR  
E. A. Youngberg, GJ  
F. E. McGinley, GJ  
J. C. Westbrook, GJ  
A. J. Breslin, HSL, NY  
W. W. Wright, Nat. Lead Co. of Ohio  
R. G. Mercer, New Jersey Zinc Co., Pa.



UNITED STATES  
ATOMIC ENERGY COMMISSION  
HEALTH AND SAFETY LABORATORY  
376 HUDSON STREET  
NEW YORK, N. Y. 10014

September 25, 1973

Dr. John W. Gableman  
Division of Production and Materials Management, HQ

**RADON-222 ANALYSES**

We have completed the radon-222 analyses of the six additional air samples collected at Palmerton, Pennsylvania. The sample descriptions are from the note accompanying each sample. The results of the measurements are shown below.


<u>Sample</u>	<u>Collection Date and Time</u>	<u>pCi Rn-222/liter*</u>
#1 Bottle #3	(Not given - assumed to be 19 September 73) 1020 EST	0.53 $\pm$ .02
#2	19 September 73 1020 EST	0.73 $\pm$ .02
#3 Bottle 1A	19 September 73 1030 EST	0.14 $\pm$ .01
#4	19 September 73 1040 EST	0.13 $\pm$ .01
#5	19 September 73 1045 EST	0.12 $\pm$ .01
#6	19 September 73 1140 EST	1.6 $\pm$ .1

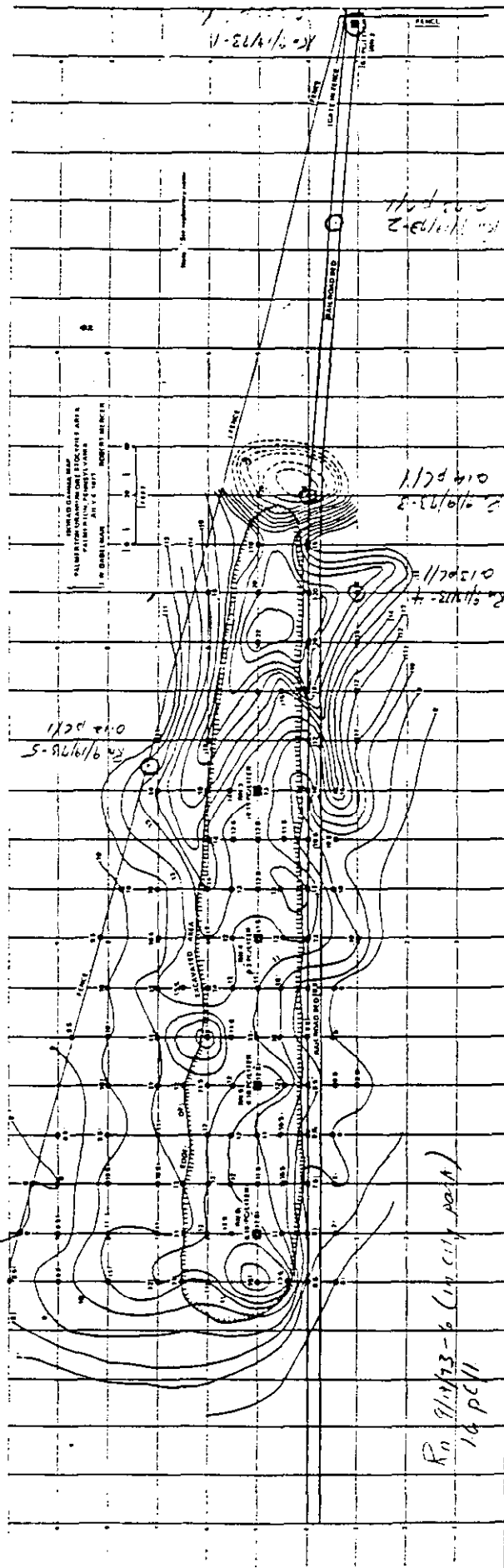
\* Corrected to Collection Date and Time.

*Isabel M. Fisenne*  
Isabel M. Fisenne, Chemist  
Radiochemistry Division--HSC

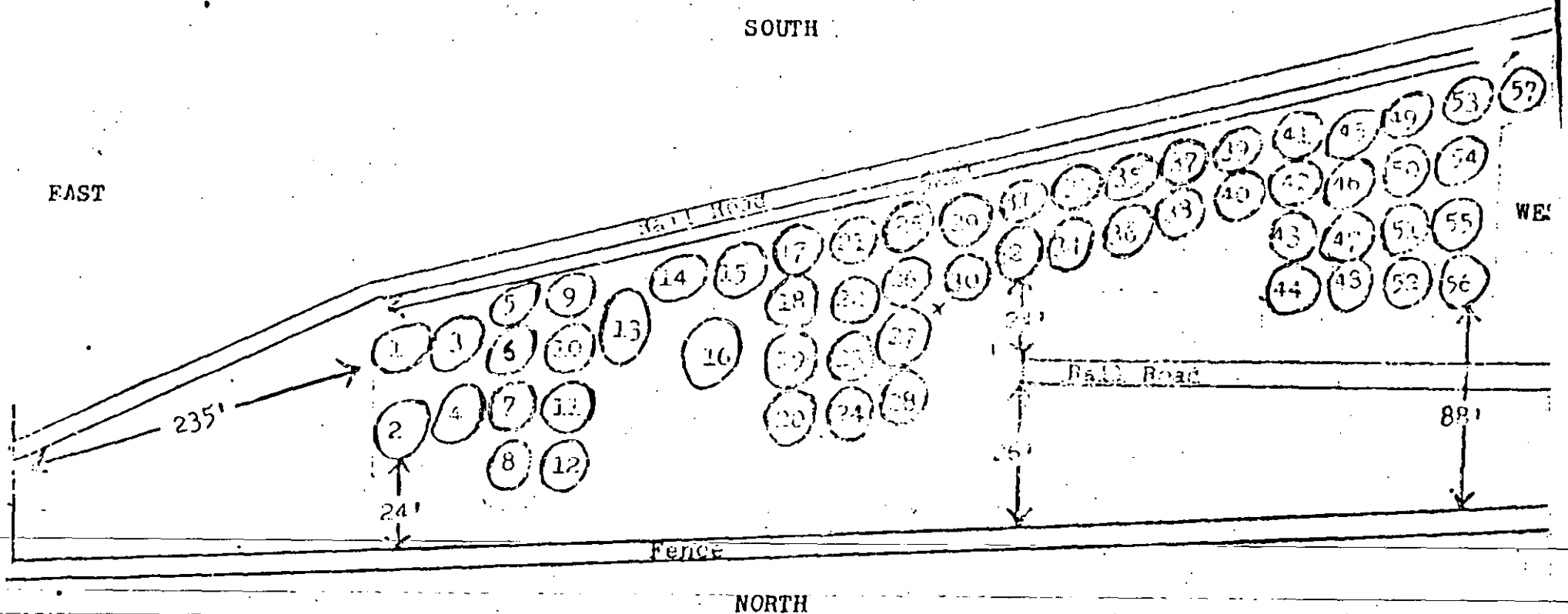
cc: G. A. Welford, HSC  
A. J. Breslin, HSH

NOTES TO ACCOMPANY ISORAD GAMMA MAP

1. Survey made after ore removal and subexcavation to 2-1/2 feet maximum.
2. Data shown obtained with Eberline Model PRM-4 Scintillation Counter with SPA-2 probe reading in K (1000) counts per minute.
3. Radon samples (RN-2, ) obtained by sucking atmospheric air into jugs at 3.0 feet above ground. Radon concentrations determined by Isabel Fisenne, Chemist, Radiochemistry Division, Health and Safety Laboratory, AEC, New York City. Values reported in picocuries Rn-222 per liter of air.
4. Radon background in City Park = 0.29 pc Rn-222 per liter.
5. The natural background base level for comparison with stockpile area measurements is selected as the highest measured in the natural environment: 12.2 k cpm at 3.0 feet. Therefore maximum acceptable for decontamination (at 2-1/2 x bkgr) is 30.5 k cpm at 3.0 feet.



STOCKING ARRANGEMENT  
URANIUM BEARING ORE - STOCKED FOR ATOMIC ENERGY COMMISSION  
AT N.E. CORNER PALMERTON EAST PLANT



Numbers refer to truckloads.

Red circles indicate lots.

To identify lot numbers see tabulation attached.

11/17/54.

June 12, 1973

R. E. Hollingsworth, General Manager

THRU: G. F. Quinn, AGMP

DISPOSAL OF ORE STOCKPILE AT PALMERTON, PENNSYLVANIA

During 1954 the Division of Raw Materials purchased at a buying station established at the New Jersey Zinc Company smelter, Palmerton, Pa., 360 tons of uranium ore mined at Jim Thorpe, Pa. Insufficient ore was mined to justify a mill in the eastern U.S., and it has been uneconomic to ship the ore to a Western or Canadian mill. We now wish to dispose of the stockpile as part of our buying station cleanup program.

In accord with the May 29, 1963, memorandum (Leudecke to Headquarters and Field Offices, regarding low level solid radioactive waste burial, copy enclosed), approval is requested to dispose of the subject AEC-owned ore stockpile by adding it to a raffinate pond currently being covered at Fernald, Ohio. This disposal method is preferable to deposit in a commercial burial ground for the following reasons: The cost of burial at West Valley, New York, the closest commercial site, would be about \$52,000 compared to \$12,000 at Fernald. Also, the commercial burial of natural ore may set a precedent which could have disadvantageous effects on programs for the disposal of uranium mill tailings, and might bring pressure for such disposal of mine dumps, and even outcropping natural uranium deposits too low grade to mine. The cost of processing the ore at the closest domestic mill (Colorado) would be approximately 20 times its value.

Frank P. Baranowski, Director  
Division of Production and  
Materials Management

PMM:JWG

Enclosure:  
As stated.

EA  
R.J.Catlin  
6/ /73

WMT  
H.A.Nowak  
6/ /73

OS  
R.E.Allen  
6/ /73

OFFICE ▶	PMM	PMM	PMM:Dir	AGMP	EAGM	DGM
SURNAME ▶	J.W.Gabelman	R.D.Nininger	Baranowski			
DATE ▶						



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

August 28, 1973

Memorandum to Files

TRANSFER OF THE PALMERTON URANIUM ORE STOCKPILE

Introduction

For background please refer to the Palmerton ore stockpile file and particularly to J. W. Gabelman's memoranda of January 29, 1973, June 7, 1973, and June 15, 1973.

Pretransfer Activities

The stockpile was visited June 19, 1973, with Dr. Arthur A. Socolow, State geologist of Pennsylvania, for the purpose of selecting specimens for university research and museum display. Dr. Socolow will serve as the distributing agent to interested organizations. He collected approximately 1,300 pounds of high-grade ore. I collected approximately 300 pounds for local and other distribution.

June 20, gamma measurements were made with Mt. Sopris and Eberline scintillation counters to establish background for the area (attachment A). Selected key points included the city park in the center of Palmerton across the street from the New Jersey Zinc Company laboratory, the Main Gate parking lot for the East Plant, and the gravel flood plain of Aquashicola Creek--a mile and 2.2 miles east of the plant. The highest reading recorded was 90 counts per second (Mt. Sopris) and 12.7k counts per minute (Eberline) at ground level in the Palmerton park. This is equivalent to about 0.016 milliroentgens per hour. This reading was used as the standard for comparison during cleanup operations.

Transfer of the Stockpile

The loading operations were attended and witnessed by Mr. R. G. Mercer, Coordinator of Production and Planning, New Jersey Zinc Company; Mr. R. E. Allen, Division of Operational Safety (OS); Dr. J. W. Gabelman, Division of Production and Materials Management (PMM); Mr. Connie Shelloc, Superintendent of Aggregates, Inc., a subsidiary of the New Jersey Zinc Company; the front-end loader operator; and three laborers.

Six gondola railroad cars of greater than 70-ton capacity each were placed on the siding alongside the stockpile the morning of June 21. The ore was loaded into the cars with a rubber-tired front-end loader with a smooth cutting edge bucket of 6-ton capacity. The average load capacity was twice determined at 6 tons by weighing the loader empty

August 28, 1973

and then full at the company scales about one-half mile distant. The load for each car was arbitrarily placed at 10 buckets as a precaution against overloading the cars. The remainder was distributed among the cars.

Loading began at 10:00 a.m. and was completed by 1:00 p.m. During loading, the operator was instructed to include underlying floor slag 6 inches deep; the undercut area extended at least 6 feet outward from the ore area. As undercutting progressed, however, a cut approached 1 foot deep in the middle of the area.

Upon completion of loading, the area was surveyed cursorily with three radiation detection instruments--(1) the Mt. Sopris scintillation counter, (2) the Eberline scintillation counter, and (3) a Nuclear Chicago geiger counter. Much of the area was above 60 microroentgens per hour over the Palmerton Park background of less than 20. The maximum acceptable residual radioactivity had been established arbitrarily at 40 microroentgens above the natural background at Palmerton Park (see McCool's memo., 6/7/73; attachment E). Examination proved that virtually all this radioactivity was caused by chunks of ore which had been pushed by the loader into the muddy soil beneath the slag, or had been pushed aside. Before undercutting the area further, a radiometric search was made for all such pieces. These were picked up and thrown into the cars by hand. A further radiometric check following this operation disclosed that a segment about 50 feet long at the east end of the area was still unacceptably radioactive. The chunks causing this radioactivity were not visible and must have been pushed further down into the mud. At that point the loader was released for the day, and Mr. Mercer was requested to deepen the excavation at a later date.

June 22 the ore in the cars was covered with 10-foot wide strips of 10-mil (thick) plastic cut to approximately car length. Edges of the plastic were wrapped in 2 x 6 or 4 x 4 wood planks averaging 6 feet long to anchor the load. The cars were then released for shipment.

#### Postremoval - Preliminary Cleanup

The plan mutually agreed upon by PMM and OS was to scrape only 6 inches beneath the stockpile for loading and transfer to Ohio. Any additional unacceptably radioactive substrata were to be placed on the company's slag dump and rolled down the 100 foot slope for maximum distribution at the site where the dump is being extended eastward at the rate of 50 railroad cars of slag per day.

Mr. Mercer was requested to remove an additional foot of slag and clay-rich soil from the east end of the pile area and transfer it to the slag dump. This removal was performed June 22. The area at the east end of the stockpile, which was most radioactive because of buried chunks, was

August 28, 1973

excavated to a total depth of 2 to 2-1/2 feet. This excavated area became a sump during ensuing heavy rains and never completely dried out. The additional material removed and the slag for backfill were hauled by the Wilson Putt Trucking Company, another NJZ subsidiary.

#### Postremoval Survey

I returned to the area July 5, 1973, and performed the postremoval survey. ✓  
An isorad gamma map was prepared and six radon samples were taken and sent to the AEC Health and Safety Laboratory in New York for analysis. The results of this survey are reported in attachment D.

The entire stockpile area and margins were found to be below the maximum selected radioactivity of 60 microroentgens per hour. However, a radon anomaly of 20 times background was found at the railroad gate about 200 feet east of the stockpile area. The radon levels in the pit beneath the stockpile area were less than the background radon concentration in Palmerton City Park.

The actual stockpile area is thus at acceptable radioactivity and backfilling of the pit was approved by OS. However, OS requested an investigation of the radon anomaly at the railroad gate. I believe this radon is being exhaled from the ground in a strip 10 to 20 feet wide circumferential to the excavated stockpile area and drifting down wind. Much of this strip was included in the gamma isorad survey and is at acceptable gamma levels. However, further measurements will be made at a later date. Any further removal of slag and soil from this marginal strip will involve lifting and relaying the rails and ties.

July 12 I informed Mr. Mercer that the company could proceed to backfill the pit. Slag will be used. I requested that the edges of the filled area be sufficiently marked to distinguish the pit area from the circumferential strip in case further removal is necessary. Upon completion of this backfilling, the company will present Grand Junction an invoice for disposal cost to date. Further activities will have to be covered by a new purchase order.

#### Transport of the Ore

All six gondolas were supplied by the Lehigh Valley Railroad. The ore itinerary was as follows: Out of the plant on the New Jersey Zinc Co.-owned Chestnut Ridge Railroad; to Allentown, Pa., by Lehigh Valley Railroad; to Cumberland, Md., by Reading Railroad; to Cincinnati by Baltimore & Ohio Railroad; and to Fernald, Ohio, probably by Chesapeake & Ohio Railroad. The cars were retrained by humping at these exchange points. Five of the cars arrived without incident at Fernald, Ohio.

August 28, 1973

During humping at Rutherford (Harrisburg), Pa., Lehigh Valley car No. 33485 was broken upon impact. The top rail on one side broke about in the middle of the car and the 1/4 inch gauge steel side buckled outward. A space 12 feet long and a maximum of 3-1/2 inches wide opened between the side and the wooden floor. Ore fell through this opening onto a steel ledge which was part of the bottom support of the car. Later inspections showed that the top rail had broken in this location several times previously; and according to the Reading Railroad car shop foreman, had never been repaired in accordance with accepted standards. The car had been inspected and passed by the Reading line prior to humping. Its damaged condition was noted in passing by a shop worker. The yard staff did not know the contents of the car, but reasoned that the plastic cover indicated the need to maintain containment and the car was held for investigation. The car shop foreman later estimated that 10 or more tons of ore could have been lost during further transport.

Reading railroad officials contacted National Lead of Ohio, who in turn contacted Oak Ridge through Grand Junction. The decision was made to reload the ore into an acceptable car and decontaminate the Lehigh Valley car and loading equipment under AEC supervision.

I was contacted at Palmerton, Pa., on July 5. Returning from Palmerton, Pa., July 6 and 7, I examined the car and the site of the accident at Rutherford, Pa.

I determined that the impact had occurred on westbound hump track No. 13 at approximately the middle of the half mile length of this track. Twenty-three cars had been humped ahead of it, and the track holds 50 cars. I examined two-thirds of the length of this track carefully with the Mt. Sopris scintillation counter and determined that no ore had spilled onto the right-of-way during or after impact. Highest radioactivity noted was that of coal slack in the road bed at 100 counts per second compared with the background of 60. This increase is attributed to a small amount of uranium in the coal and shale.

Car 33485 had been spotted on a siding with Reading Gondola No. 31622 alongside for transfer of the ore. Examination showed no spillage beneath Lehigh Valley 33485 along the siding, but a considerable quantity of ore was piled along the lower ledge mentioned earlier. Reading 31622 was full of holes and then unacceptable for use.

July 9 I arranged details of the transfer with Ralph E. Houser, General Foreman of Car Inspectors, at the Rutherford yard. He preferred to use the car already placed because of its all-steel bottom and larger capacity and promised to patch all holes with an acceptable tape. I inspected and approved the patches during loading. I instructed him to save the plastic cover off the Lehigh Valley car, to place canvas between

August 28, 1973

the cars to catch most of the spillage, and to hose down thoroughly with water the railroad crane bucket used and the Lehigh Valley car.

I observed most of the ore transfer which began at 4:00 p.m., July 10, and was completed by 8:00 p.m. The morning of July 11 I supervised the cleanup of the ore spilled between the cars. I assured with the Mt. Sopris scintillation counter that the resulting radioactivity did not exceed 1-1/2 times background. This was done by hand shoveling up sand- and gravel-sized pieces of ore and the underlying railroad bed.

The crane and both cars were then moved to a siding where a water hose was available. The crane was washed and assured to be at background. The Lehigh Valley car was washed and brush-scrubbed thoroughly and all ore fragments removed from the crevices, particularly along the lower ledge mentioned. The resulting radioactivity of the car did not exceed 1-1/2 times background at any point. The railroad bed at the site of washing was excavated by hand and all ore-contaminated material loaded into the Reading car. Between 1/3 and 1/2 tons of railroad bed was removed. The resulting radioactivity of the bed did not exceed 1-1/2 times background at any point. The cars and crane were then released for normal service. The Reading car containing the ore moved out at approximately 7:00 p.m., July 11. The Lehigh Valley car was returned empty to the Lehigh Valley shop.

*John W. Gabelman*  
John W. Gabelman  
Staff Geologist  
Division of Production  
and Materials Management

PMM:JWG

## Attachments:

- A. Background Gamma Radioactivity.
- B. Index Map of Palmerton East Plant.
- C. Isorad Map of the Stockpile Area.
- D. Radon-222 Analyses.
- E. McCool's memo., June 7, 1973.

cc. R. D. Nininger, PMM  
F. K. Pittman, WMT  
R. J. Catlin, EA  
R. E. Allen, OS  
B. M. Robinson, OR  
E. A. Youngberg, GJ  
F. E. McGinley, GJ  
J. C. Westbrook, GJ  
W. W. Wright, Nat. Lead Co. of Ohio  
R. G. Mercer, New Jersey Zinc Co., Pa.

BACKGROUND GAMMA RADIOACTIVITY

## East Plant Area

## Palmerton, Pennsylvania

(Measured June 20, 1973 by J. W. Gabelman)

(Mt. Sopris Model SC-131 Scintillation Counter and  
Eberline Model PRM-4 Scintillation Counter, SPA-2 Probe)

<u>Station</u>	<u>Mt. Sopris Counter Per Second</u>		<u>Eberline K(1000) Counts Per Minute</u>	
	<u>Ground Level</u>	<u>3 Ft. Above Ground</u>	<u>Ground Level</u>	<u>3 Ft. Above Ground</u>
1	90 (11)	88 (11)	12.7 (16)	12.2 (15)
2	70 (9)	70 (9)	10.0 (12)	9.7 (12)
3	74 (9)	74 (9)	10.2 (13)	10.0 (12)
4	90 (11)	84 (10)	12.4 (16)	12.2 (15)
5	88 (11)	86 (11)	10.2 (13)	10.4 (13)

(Figures in (X) are equivalent microroentgens per hour.)

Station 1: In city park across street from NJZ Co. Laboratory entrance, on black soil and grass.

Station 2: On north bank of Aquashicola Creek, 100 yards west of Main Gate to East Plant. Quartzite gravel.

Station 3: In parking lot along north margin of creek at Station 2. Paved with loose smelter slag over gravel.

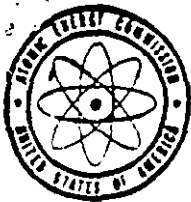
Station 4: On north flood plain of Aquashicola Creek, 1 mile east of Main Gate to East Plant, along highway. Black soil overlying tan quartzite river gravel and sand.

Station 5: North flood plain of Aquashicola Creek, 2.2 miles east of Main Gate, along highway. Ten-fifteen feet higher in elevation than creek. Tan quartzite river gravel and sand.

Calibration Factors:

1. Mt. Sopris: 0.1 mr/hr. = 800 cps.
2. Eberline: 0.1 mr/hr. = 80 K cpm.





UNITED STATES  
ATOMIC ENERGY COMMISSION  
HEALTH AND SAFETY LABORATORY  
878 HUDSON STREET  
NEW YORK, N. Y. 10014

Attachment D

212-620-3643

July 10, 1973

Dr. John W. Gableman, Division of Production  
and Materials Management, HQ

**RADON-222 ANALYSES**

We have completed the radon-222 analyses of the six air samples collected at Palmerton, Pennsylvania. The sample descriptions are from the note accompanying each sample. The results of the measurements are shown below.

<u>Sample</u>	<u>Collection Date and Time</u>		<u>pCi Rn-222/liter*</u>
Palmerton 1 - Park (W end) directly across from NJ 2 Co. lab - Background 3' above ground	5 July 73	1120 EST	0.29 $\pm$ .01
Palmerton 3 - Stu 1 $\frac{1}{2}$ - line 2	5 July 73	1300 EST	0.15 $\pm$ .01
Palmerton 2 - At RR gate in fence at extreme E end of stockpile area - 3' off ground	5 July 73	1345 EST	6.4 $\pm$ .04
Palmerton 4	5 July 73	1602 EST	0.20 $\pm$ .01
Palmerton 5	5 July 73	1608 EST	0.18 $\pm$ .01
Palmerton 6 - Taken at 6" off ground (others at 3' off ground)	5 July 73	1615 EST	0.15 $\pm$ .01

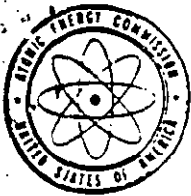
\* Corrected to Collection Date and Time.

As we discussed in our phone conversation, any future samples should be collected early in the week to avoid shipment and measurement delays.

*Isabel M. Fisenne*

Isabel M. Fisenne, Chemist  
Radiochemistry Division, NY

cc: G. A. Welford, HSC  
A. J. Breslin, HSH



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

Attachment E

JUN 7 1973

J. W. Gabelman, PMM

DISPOSAL OF ORE STOCKPILE AT PALMERTON, PENNSYLVANIA

This division concurs with the disposal methods proposed in your report to Dr. Nininger. It is noted that the plan does not indicate the levels of radioactive contamination that will remain at this site after cleanup. For this purpose, we recommend that after cleanup of this site the beta-gamma radiation levels at three feet above the surface should not exceed 40 microroentgens per hour above background, and the radon concentrations, including all of the daughter products ordinarily found in unfiltered air, should not exceed twice the background levels determined in areas surrounding this site.

A handwritten signature in dark ink, reading "W. J. McCool", is positioned above the typed name.

W. J. McCool, Deputy Director  
Division of Operational Safety

JUN 7 1973

J. W. Gabalman, FHM

**DISPOSAL OF ORE STOCKPILE AT PALMERTON, PENNSYLVANIA**

This division concurs with the disposal methods proposed in your report to Dr. Mininger. It is noted that the plan does not indicate the levels of radioactive contamination that will remain at this site after cleanup. For this purpose, we recommend that after cleanup of this site the beta-gamma radiation levels at three feet above the surface should not exceed 40 microroentgens per hour above background, and the radon concentrations, including all of the daughter products ordinarily found in unfiltered air, should not exceed twice the background levels determined in areas surrounding this site.

Original signed by  
Whittie J. McCool

W. J. McCool, Deputy Director  
Division of Operational Safety

*This  
was  
Cleaned up  
June 21, 1973  
JH*

OFFICE ▶	OS:PFS	OS:DIR				
SURNAME ▶	BEAllen/mch	WJMcCool	El hop			
DATE ▶	6/7/73	6/7/73	6/7/73			



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

JUN 7 1973

Robert D. Nininger  
Asst. Dir. for Raw Materials  
Div. of Production and Materials Management

SUPPLEMENTAL REPORT - PALMERTON ORE STOCKPILE

Introduction

This report supplements my file memorandum of January 29, 1973, with additional data, analyses of samples, and specific recommendations for the cheapest feasible disposal of the referenced stockpile.

Recommendation

It is recommended that the Palmerton stockpile be dumped in a raffinate pond now being filled at Fernald, Ohio, at a total disposal cost of about \$11,500. This is the cheapest and most practical alternative. This should be done immediately while FY 1973 funds are available.

Supplemental Data

Environmental Radioactivity:

At the request of Division of Operational Safety (Attachment 1), the measurements of radioactivity on the stockpile and immediate vicinity are presented in microroentgens per hour and microcuries per gram (Attachment 2). The Eberline instrument used was calibrated by Cleveland W. Sullivan of Division of Bio-medical and Environmental Research. The radioactivity is low enough ( 0.0005 microcuries per gram) for the ore to be classed as "Low Specific Activity Material."

These measurements have little meaning in terms of environmental effect as long as the stockpile is there. A post-removal survey will be made to determine any residual radiometric effects which might be undesirable.

Sample Analyses:

Samples had been taken of coarse bulk ore from every eighth ore pile and of crushed rejects of former sampling from every fourth pile, as well as soil and water samples from the area. These were analyzed by Lucius Pitkin, Inc., contractor for the Grand Junction AEC Office, and are reported in Attachment 3.

It is pertinent to note (Attachment 3, p. 3) that the radioactivity from radium which has apparently leached from the ore into the underlying and surrounding soil is approximately two orders of magnitude less than that from radium in the ore. Thus leaching of radium from the ore into the underlying soil can be considered minimal. The radon from radium presently in the top soil, assuming equilibrium, would be on the order 15 picocuries per liter of air maximum, which would amount to about one-sixth of the MPC of one-third WL per year, assuming continuous exposure. This is below the safe limit. However, even most of this can be removed easily by taking the top foot or so of soil.

It is of passing interest to note that river water from gravel beneath the flood plain of Aquashicola Creek contains at least an order of magnitude less uranium and radium than the natural water from the Shawangunk sandstone taken from a 300 foot deep well. Further, the flood plain well downstream from the stockpile contained three times less radium than the upstream well. Thus it can safely be assumed that there has been no significant loss of uranium and daughters to the stream.

#### Value of Stockpile:

All the ore piles are about the same size, representing capacity single loads for one type of truck. Thus the samples can be averaged arithmetically.

The arithmetic average grade of the stockpile as determined from the 1973 sampling (Attachment 4) is 0.32 percent  $V_2O_5$  and 0.17 percent  $U_3O_8$ . This is considered a more realistic average than that determined by 1954 sampling which involved fewer samples and analyses.

Based on the Union Carbide Corporation's 1973 buying schedule for ores delivered to Uravan, Colo., the ore is worth \$10.03 per ton delivered. No lime penalty is assumed. This mill is currently the only one processing hi-vanadium ores. Assuming 360 tons, total gross value is about \$3,600.

An amenability test by National Lead Company in 1956 (WIN-33) concluded the ore to be amenable to acid leaching followed by CCD or filtration and column ion exchange, or acid leaching and RIP.

The mills which might be willing to receive this ore include UCC, Uravan, Colo., Atlas Corp., Moab, Utah, and Susquehana Western, Tex. The Susquehana Western mill at Edgemont, S. Dak., is closed.

Cost of Delivery:

Freight Rates

The rates presented January 29, 1973, supplemented by rates to suitable burial grounds, are presented in Attachment 5. Data were provided by Grand Junction Office and Division of Waste Management and Transportation.

Cost of Loading

Cost of loading in either cars or trucks has been estimated very approximately by New Jersey Zinc Company and reported informally at \$500.00.

More accurate cost and time estimates will be submitted by the company in a letter responsive to our written request that they load the ore on our behalf according to a specified plan. Cost will vary depending on the type of car used. DOT regulations for shipping Low Specific Activity Materials specify the containers must be covered. Boxcars are most costly to load. Open gondolas are cheaper to load, and can be tarp-covered.

Disposal Schemes

General:

Disposal schemes described January 29, 1973, stimulated comments from OS and WMT. The schemes and their ramifications and consequences were discussed at a meeting May 3, 1973. Attendees were:

1. Robert J. Catlin, Director, Division of Environmental Affairs.
2. Henry A. Nowak, Assistant Director for Plans and Development, Division of Waste Management and Transportation.
3. Gerald H. Daly, Chief, Waste Operations Branch, Division of Waste Management and Transportation.

4. Robert E. Allen, Process Facilities Safety Branch, Division of Operational Safety.
5. Richard H. Kennedy, Metallurgical Engineer, Division of Production and Materials Management.
6. John W. Gabelman, Staff Geologist, Division of Production and Materials Management.

Guiding criteria for selecting a disposal method were concluded to be (1) environmental acceptability, (2) operational practicality (including regard for safety), and (3) cost, in that order of importance.

A license is not required to own, transport, or store the ore. The transport and burial of this material is not considered a major Federal action that would have a potential effect on the environment; and, therefore, an environmental assessment is not required.

#### Processing the Ore:

If the ore were transported to the closest mills (Bancroft or Elliot Lake), there is no present assurance that it would be amenable or command any value because of its small amount, so that transportation cost cannot be considered reducible. Further, complications may attend crossing the international boundary. As only the mills at Elliot Lake are operating, the transportation cost associated with this alternative totals about \$9,500, provided Denison or Rio Algom will accept it.

Acceptance at Uravan or Moab is the only realistic possibility because these mills treat this type of ore routinely. The total cost to Grand Junction (for transshipment by truck to Uravan, the closest mill) less the ore value totals: 23,112 less 3,000--about \$20,000.

These possibilities are considered less acceptable than disposal in a burial ground because of their high cost.

#### Disposal in an Eastern U.S. Licensed Private Burial Ground:

As the freight rates are the same regardless of the disposition of the ore, disposal sites outside the northeastern U.S. were eliminated for the same reason as western processing mills.

Disposal at a commercial licensed burial ground on payment of a one-time entry charge is possible and practical. Sites considered are West Valley, N. Y., (Nuclear Fuel Services-NFS) and Morehead, Ky., (Nuclear Engineering Co.). Freight rates are stated in Attachment 5. This alternative would comply with AEC policy of using commercial disposal services in order to avoid competition with industry (see Attachment 6).

Morehead is eliminated in favor of West Valley on the basis of freight rate. However, burial at West Valley may be complicated by the current compliance investigation there by New York State which regulates the site under letter agreement with AEC. The fuel reprocessing plant is temporarily closed, but the burial ground is still receiving material. The approximate cost of this disposal was obtained from WMT; the actual cost would be subject to some negotiation.

The charge for disposal at West Valley is currently in the neighborhood of \$1.00 per cubic foot (WMT), but a price to AEC would be about \$0.80. At a tonnage factor of 13 cubic feet per ton (to account for the high compactness and silica pore filling), total volume is approximately:

$$\frac{360 \times 2000}{13} = 55,000 \text{ ft.}^3$$

$$55,000 \times 0.80 = \$44,000$$

$$\text{Freight @ 20.40 per ton} = 7,300$$

$$\underline{\$51,300}$$

#### Disposal on AEC-Controlled Property:

Mr. B. M. Robinson was requested (through WMT) to investigate possibilities for disposal on AEC ground at Oak Ridge or Fernald. He recommended that the simplest practical disposal would be at Fernald, Ohio, where National Lead is currently filling a 6-7 acre raffinate pond for which fill is needed. The ore (virtually hard dense rock fragments of pebble to boulder size) would be deposited in the deepest part of the pond (20 feet) and the entire pond will eventually be covered by 20 feet of soil. This is an excellent coincident opportunity and is hereby strongly recommended.

R. D. Nininger

6

The cost of handling after arrival at Fernald is roughly estimated by National Lead at \$170 per railroad car or about \$1,000 for the six cars estimated to be required. Transportation would be  $\$28.80 \times 360 = \$10,368$ , and loading at Palmerton about \$500. The total is about \$12,000 for disposal. This is the cheapest alternative.

John W. Gabelman  
Staff Geologist  
Division of Production  
and Materials Management

PMM:JWG

Attachments:

1. Memo. to Files  
from J. W. Gabelman  
January 29, 1973.
2. Comments of Division of Operational  
Safety on January 29, 1973, memorandum.
3. Environmental radioactivity of stockpile area.
4. Analyses of stockpile and related samples.
5. Average grade and value of ore.
6. Freight rates.
7. Copy of May 29, 1963, memorandum,  
A. R. Luedecke to Hq. and Field Offices.

bcc:

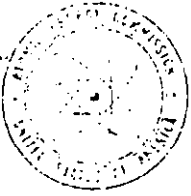
F. E. McGinley, GJ  
J. C. Westbrook, GJ

PMM  
J. W. Gabelman/jr  
6/1/73

EA  
R.J.Catlin  
6/ /73

WMT  
H.A.Nowak  
6/ /73

OS Y  
R.E.Allen  
6/ /73



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

March 15, 1973

G. Gabelman, PMM

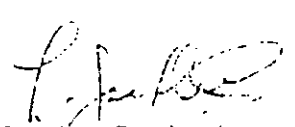
## PALMERTON URANIUM ORE STOCKPILE - DISPOSAL

Your memorandum to Files dated January 20, 1970, regarding the proposed disposal of the AEC-owned uranium ore stored on leased property at Palmerton, Pa., provides an insight to the potential problems associated with the disposal of this uranium ore. Prior to making any recommendations, we need additional information relating to the radiological condition of this site. The requirements and procedures for obtaining a radiation clearance certification are defined in AECM 5301 and its appendix. Since this manual chapter has not been distributed, we are enclosing a draft copy which defines the appropriate procedures and a copy of our memorandum which provided current suggestions for the survey and cost estimation planning.

Based upon the supplemental information you provided regarding the relationship of the counts per minute (CPM) measurements and an equivalent radiation level, it is noted that levels up to 7.5 mR/hr with an overall average level of about 1.1 mR/hr surface contact can be measured on this ore stockpile. Individual specimens were measured at about 3.75 mR/hr contact.

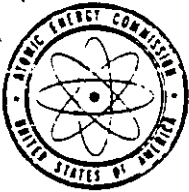
Since the ore has been stored at this location for about 20 years, there is a possibility of radioactivity leaching out of the ore pile and into the surrounding area. A more extensive radiation monitoring survey should provide data necessary to determine to what extent, if any, this has occurred.

Regarding the disposal schemes proposed in your memorandum, it has been our experience that the least costly permanent disposal method may not be desirable or acceptable from either a health, environmental, or public relations standpoint, or a combination of these. Therefore, a careful analysis must be made of all potential disposal methods for the uranium ore to determine the most acceptable method. This analysis should be based upon radiological and environmental considerations as well as costs.

  
L. J. Deal, Assistant Director  
for Health Protection  
Division of Operational Safety

Enclosure:  
As stated

11 1973



UNITED STATES  
ATOMIC ENERGY COMMISSION  
WASHINGTON, D.C. 20545

January 29, 1973

Memorandum to Files

DISPOSAL OF THE PALMERTON URANIUM ORE STOCKPILE (INTERIM REPORT)

Introduction

January 8 and 9, 1973, Henry A. Nowak, Division of Waste Management and Transportation, and John W. Gabelman, Division of Production and Materials Management, visited the New Jersey Zinc Company smelter and research center at Palmerton, Pennsylvania. In 1954 uranium ore, mined at Jim Thorpe, Pa., had been accepted, sampled, and stored in marked lots at the plant by the company acting as agent for the Atomic Energy Commission. The condition of the stockpile and surrounding environment was observed and possible means of its disposal was discussed with company representatives. Initial correspondence and telephone communication with the company was through Mr. S. F. Huyett, Vice President, Manufacturing, Allentown, and Mr. J. A. Marvin, Palmerton. Contacts at Palmerton were with Mr. Robert G. Mercer, Coordinator of Production and Planning, and Mr. Robert S. Harris, in charge of the sampling facilities. Mr. Mercer provided copies of pertinent documents describing the location and weights of 57 truckload lots comprising about 360 tons of uncrushed ore averaging 0.21 percent  $U_3O_8$ .

Inspection

Accompanied by Messrs. Mercer and Harris, the 57 piles were inspected. The piles and immediately enclosing area (see enclosed sketch map) have not been disturbed since deposition in 1954. A usable railroad passes along the south side of the stockpile area. The crushed rejects from original sampling had been placed on top of each pile and were disturbed only by the current sampling. The uncrushed ore consists of fragments of hard quartzite or conglomerate which still retain their fresh appearance. Weathering, disintegration, and leaching have been minimal.

Sampling

Splits of the samples taken at the time of stockpiling were sent by the company to Mr. J. J. Rowe, United States Geological Survey Laboratory, Washington, D. C., and to Mr. John M. Adams, Lehigh Coal and Navigation Company. Raw Materials' files on contract No. AT(49-6)-925, covering the establishment of the stockpile are being retrieved from the permanent record center. A request for copies of the analyses has been made to the Geological Survey.

January 29, 1973

The stockpile, underlying and adjacent soil, and well water from the flood plain up- and downstream from the stockpile area were sampled to determine the present value of the pile, and whether and how much uranium and daughters, or other elements, have escaped into the environment during the 19 years of storage. The new and original assays will be compared.

Representative samples of crushed rejects were collected from every fourth pile, modified to include piles 1 and 57, and coarse fragments collected from every other of the above-mentioned piles. The 22 samples resulting were further crushed and bagged in the plant sample preparation room. Drive auger samples of the top 18 inches of soil were collected from between piles 27 and 30 and from a low swamp area about 40 feet southeast beyond the railroad tracks.

Water samples were collected from the following company wells:

- (1) 9-C,  $\pm$  300 feet northeast and upstream from the stockpile;
- (2) No. 9,  $\pm$  400 feet northwest and downstream from the stockpile;
- (3) No. 7,  $\pm$  2500 feet downstream from the stockpile.

Wells 9 and 9C are 25-30 foot hand-dug wells which produce water from the gravel bed of the Aquashicola river. Well 7 is about 300 feet deep and produces water from the Shawangunk sandstone (or quartzite) aquifer. Well 7, should be effectively isolated from stockpile contamination and may suggest natural subsurface background levels for surface wells 9 and 9C. Well 9 water is no longer used because it was contaminated with manganese wasted in the area from the research laboratory.

The Division of Biological and Environmental Research is willing to have radium analyses performed for the stockpile disposal program at the Health and Safety Laboratory in New York. However, as analyses for other elements are also desirable, and Grand Junction has acquired a radium analysis capability, all the samples are being sent to Grand Junction.

#### Radioactivity of the Stockpile

Gamma radiation from the ore pile was measured with an Eberline model SC-2 scintillation counter with external 2-inch NaI probe. Average radioactivity over the pile was about  $6 \times 10^5$  counts per minute (cpm). Individual specimens commonly offered  $1 \times 10^6$  cpm and the maximum measured  $2 \times 10^6$  cpm. The piles rest on a level open surface interrupted only by the adjacent railroad track and the fenced company property line 24 to 88 feet away (see sketch). The only vegetation is a high, luxurious growth of cane which has selectively preferred the stockpile. Radiation or elements from the ore appear to have stimulated the growth. The "shine" from the ore does not reduce to the background level of  $1.0$  to  $1.4 \times 10^4$  cpm within 250 feet of the ore. The toe of the zinc slag dump, about 300-350 feet away, is at  $6 \times 10^3$  cpm.

January 29, 1973

Loading Facilities

The adjacent railroad will permit crane loading, but the pile is probably too small to justify a crane. The ore can be easily loaded with a front-end loader at the site if deposited in trucks and at a ramp more than 1000 (?) feet distant if deposited in rail cars. The 360 tons represents about 6 railroad carloads or 30 to 60 truckloads. Although easier to load, trucks will be practical only if the pile is moved within the local area.

Value of the Stockpile

Upon receipt of analyses, the stockpile will be valued in terms of current uranium and vanadium content, processing amenability, and freight rates. However, it is obvious now that the ore is worthless as uranium mill feed.

Evaluation by Gardener in 1959, based on original analyses, concluded the stockpile value to be less than the cost of transportation and processing. The current evaluation is expected to result similarly because uranium price has decreased, the piles have probably been leached, and freight rates have increased.

Comparative Rail Freight RatesPalmerton, Pennsylvania, to Indicated Destination

<u>Destination</u>	<u>1959*</u>	<u>1973**</u>
Bancroft, Ontario.....	\$11.80	\$28.80
Blind River, Ontario.....	15.40	-
Elliot Lake, Ontario.....	-	26.40
Edgemont, S. Dakota.....	37.60	54.80
Riverton, Wyoming.....	43.40	-
Canon City, Colorado.....	38.20	54.80
Bluewater, New Mexico.....	-	64.20
Grand Junction, Colorado		
(for transshipment to Uravan)...	-	64.20
Green River, Utah		
(for transshipment to Moab).....	-	67.20

\* C. I. Garden memorandum.

\*\* Headquarters, Division of Construction, verified by GJO.

January 29, 1973

Assuming an average grade of 0.2 percent  $U_3O_8$  and 0.5 percent  $V_2O_5$ , the value of the ore on Union Carbide's uravan ore schedule would be about \$12.00 per ton. Balanced against the cheapest freight rate, the Mauch Chunk rock is worthless. Therefore disposition of the pile should probably be on the basis of the least costly permanent disposal with minimum environmental impact, and without expectation of recovering the cost of acquisition or disposal.

#### Disposal Schemes

The following broad categories of disposal and specific schemes were discussed:

1. Process the ore, and possibly underlying soil, to concentrate. Despite cost exceeding value this would permanently dispose of the ore, permanently remove uranium daughters and radiation from the site, and refer the waste storage problem to an existing tailings disposal site. This was considered the most satisfactory method to the greatest number of interests, although perhaps the most costly.
  - a. Bancroft, Ontario, is the closest existing uranium mill presently on standby. Ore is already stored there. However, the vanadium and molybdenum in Mauch Chunk ore may be non-amenable, and crossing the international boundary may be difficult.
  - b. Elliot Lake, Ontario, has the closest presently operating mills so that further storage would not be required, but the ore may not be amenable.
  - c. The closest western U. S. mill presently processing similar ores, thus eliminating the amenability problem, is at Edgemont, South Dakota. Freight to Edgemont is \$54.80 per ton. In favor of this scheme are that the Edgemont mill is presently threatened with closure for lack of ore, vanadium slag is presently being bought for feed, and the company, through its former railroad holdings, may be able to command a reduced freight rate. The Susquehanna Company may be interested in the Mauch Chunk ore to prolong their mill life.
  - d. The Zinc Company may be able to use the ore as siliceous flux.
2. Transport the ore to a permanent disposal site or another storage site. This method defers the disposal and contamination problems to another place and time, but would not remove or solve them. It is the least advisable.

January 29, 1973

- a. Storage at the AEC site near Niagra Falls, perhaps the closest waste storage site. Mr. Nowak investigated this possibility and found it inadvisable.
  - b. Storage at some other AEC waste storage site.
  - c. Return the ore to the holes from which it was mined, or new excavations, at Jim Thorpe, Pa. Although one of the cheapest schemes, new excavations would be required in addition to the old holes because of the swell factor. Ground water would find these holes selective percolation sites and leached uranium and radium may enter ground or surface water systems available for human consumption. The local populace, once educated to the potential radiation hazards, may object to any form of storage or disposal in that area.
  - d. Donate or sell the ore to a company exploring or interested in developing a vanadium-uranium mine at Jim Thorpe, for storage in the event that a mill is eventually built. Perhaps the best scheme in terms of conservation, there is no present prospect that a mine or mill will be developed there in the foreseeable future. Union Pacific Railroad, currently exploring the area, is not interested in receiving the ore because they believe its storage would be objectionable to the local populace.
  - e. Donate the ore to the New Jersey Zinc Company to store in the event that a mill is eventually built in the area, or to dispose of as they see fit. Officials stated they had no basic objection to the presence of the ore, but did not wish to be responsible for the AEC-owned ore. The company received this suggestion without comment, pending internal review. If the company does not wish to store the ore for its own use, it will probably not undertake disposal at its own expense.
3. Scatter and/or dilute the ore.
- a. Mix the 360 tons of ore with the many millions of tons of waste smelter slag in the dump no more than 2000 feet away. With planning and supervision this could be done so that the ore would completely lose its identity and be diluted to harmlessness. The slag is being mined and sold for various industrial uses (mostly concrete aggregate or road metal) at about the same rate that slag is produced. Edifices or roads containing ore fragments would probably not exceed background radiation. When probed about this scheme, Messrs. Mercer and Harris discretely and unofficially

January 29, 1973

accepted this as the best scheme and roughly estimated the disposal cost at \$500.00 to \$1,000.00. This is regarded as the cheapest scheme and in the long run most practical.

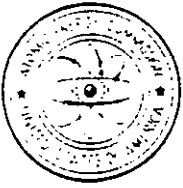
- b. Donate the ore in small lots to universities, research laboratories, museums, and geophysical companies for scientific purposes. Most such organizations would probably wish to receive small lots. However, this scheme would involve lengthy administrative work, and the pile would have to be moved to an interim site because the company does not wish to receive numerous visitors at the site. Part of the pile could be placed on a concrete pad at a nearby designated public site for a limited period. Through advertisement the scientific community and amateur mineral collectors could be invited to collect any amount desired. The Pennsylvania Geological Survey may be willing to oversee such a scheme for the public relations value it would have.

*John W. Gabelman*  
John W. Gabelman  
Staff Geologist  
Division of Production  
and Materials Management

PMG:JWG

Enclosure:  
Map

cc:  
M. B. Biles, Dir., OS, HQ  
F. E. McGinley, Asst. Dir., Ore Reserves  
and Production Div., GJ



UNITED STATES  
ATOMIC ENERGY COMMISSION  
GRAND JUNCTION OFFICE  
GRAND JUNCTION, COLORADO 81501

February 9, 1973

R. D. Kininger, Asst. Dir. for Raw Materials, PM4, HQ

CLEANUP PLANS FOR AEC ORE BUYING SITES

In response to the request from Division of Operational Safety the following presents the status of cleanup at the five sites in the Western United States.

Site	Years Operated	Area (Acres)		mR/hr @ 3'	Cubic Yds. to Remove & Replace	Est. Cost	Program Plan Status
		Leased	Contam- inated				
1. Falls City, Texas	1959-63	20	3	0.3	2,300	\$ 18,000	6
2. Globe, Arizona	1955-60	136	7.5	0.8	4,000	27,000) 36,000) * 95,000)	3
3. Grants, New Mexico	1956-60	27	9	0.4	4,700	25,000	5
4. Marysvale, Utah	1950-58	13	9.6	0.9	5,700	27,000) * 107,000)	2
5. Monticello, Utah	1948-62	80	23.7	0.5	14,700	71,000 **	2

\* Depends on distance contaminated dirt must be hauled.

\*\* Contamination in Monticello may be more extensive than estimated, and cost could be somewhat higher.

The "Program Plan Status" refers to the stage of action as of this date as shown in the attachment.

Currently plans are to perform cleanup in the sequence as listed. Cleanup at the Falls City, Texas site commenced on February 5 and is

R. D. Mininger

-2-

February 9, 1973

expected to be completed in about 15 workdays, including followup field surveys. Estimated completion dates of all field work are as follows:

Falls City	February 23, 1973
Globe	March 23, 1973
Grants	April 20, 1973
Marysville	May 18, 1973
Monticello	June 30, 1973

Funds in the amount of \$250,000 have been allotted for this program.

Decontamination criteria are that cleanup or decontamination will be conducted to attain the lowest practicable gamma radiation level. If it becomes necessary to specify a level we will use the DOS suggestion of peak gamma radiation levels, attributable to surface deposits, are not to exceed 0.04 mR/hr above background as measured three feet above the ground surface.

There has been no cleanup experience to date but this will be reported in subsequent reports. Also, no unusual or unexpected problems have been encountered to date.

To complete your files and those of DOS we are enclosing one set of LPI reports on each of the above discussed sites.

Regarding the Palmerton, Pennsylvania site we expect to commence analysis of the samples taken by Dr. Gableman as soon as they are received at GJO.

Elton A. Youngberg  
Manager

Attachments:

Ore Buying Site Cleanup Program Plan  
LPI Reports 912 - 2, 3, 4, 5, 6, 9, 14

cc: / Martin B. Biles, DOS, HQ w/enclosures

Ore Buying Site Cleanup

PROGRAM PLAN

<u>Action</u>	<u>Responsibility</u>
1. Advise responsible State officials of plans for radiation surveys and invite participation.	GJO
2. Contact current land owners and obtain permission to perform radiometric surveys. Measure and plot on maps the contaminated areas. Determine depth of contamination and estimate quantity and excavation costs. Investigate disposal sites and estimate haulage and disposal costs. Investigate availability and cost of suitable fill. Estimate travel, supervision, followup survey, and miscellaneous costs. Prepare reports.	LPI
3. Contact State, solicit continued cooperation, review cleanup plans, get approval of decontamination criteria, and of disposal site. Provide suggested press release for the State to issue to the local press, if recommended by the State.	GJO
4. Obtain bids or proposals from local contractors, make selection and award contracts.	LPI
5. Obtain written agreement with property owners to perform cleanup.	GJO-LPI-STATE
6. Commence cleanup under LPI direction as weather and ground conditions permit. Continuous radiation monitoring during cleanup by LPI.	LPI
7. Resurvey site and prepare post cleanup maps and reports.	LPI
8. Provide State and property owners with final maps and reports.	GJO
9. Report to HQ (RM, PMM, OS, WMT, EA, etc.) on progress and final results of program.	GJ O

GJO:FEM  
012273

APPENDIX 2

Correspondence on Mining of  
ORE Stored at Palmerton

Office Memorandum • UNITED STATES GOVERNMENT

TO : Files

DATE: April 15, 1953

FROM : R. W. Edmonds, Mining Engineer  
Division of Raw Materials, New York

SUBJECT: URANIUM PROPERTY OF LEHIGH COAL & NAVIGATION COMPANY  
NEAR MAUCH CHUNK, PENNSYLVANIA

SYMBOL:RMP:RWE:ml

On the afternoon of April 15, 1953 Mr. John Adams called me on the phone from Allentown, Pa., re above subject.

Mr. Adams said that the cross-cut tunnel near the 1800 ft. mark had been extended into the mountain for a distance of about 35 ft. and had passed through the red shale and sandstone which crops out on the side of the mountain above the road.

He said that on the recommendation of Dr. Dyson, their consultant, several drill holes had been put in from the road near an old cut near the Mauch Chunk sign. According to Mr. Adams the holes were put in more or less horizontally. A hole near the old cut referred to has shown some interesting results. The hole has now reached a length of 55 ft. and has penetrated material carrying a black uranium mineral and also some carnotite. He said that Dr. Dyson desires to have the hole continued to about 150 ft. Mr. Adams said that Dr. Dyson was having the core assayed and that he would render a summary report the latter part of this week about the findings to date. Mr. Adams said that he would send us a copy.

After a few more drill holes are put down it is planned to drive a cross-cut near the Mauch Chunk sign. He said that when this was done there will probably be some material of ore grade and he said that the Lehigh Company would like to know where to send it. He then referred to a letter which Mr. Gillingham wrote to Mr. L.C. Conant on March 13, 1953, which letter stated that arrangements for marketing the Mauch Chunk ore would have to be worked out between the Lehigh Co. and Mr. Johnson and that Mr. Conant should hear from Mr. Johnson within a few days. Mr. Adams said that the Lehigh Co. had not received any word from Mr. Johnson and wanted to know whether or not Mr. Conant should write to him. I stated that I would look into the matter and advise him what to do.

Files

- 2. -

April 15, 1953.

Mr. Adams said that he expected to be in New York on April 16th but that he did not believe he would be able to call at our office. He said, however, that he would call me on the phone so that I could advise him what steps the Lehigh Company should take, if any, concerning the shipment of any ore that might be found at the Lehigh property.

# THE LEHIGH COAL AND NAVIGATION COMPANY

FIDELITY-PHILADELPHIA TRUST BUILDING - PHILADELPHIA 9, PA.

L. C. CONANT  
CORPORATE ENGINEER  
AND  
REAL ESTATE AGENT

March 2, 1953

ENGINEERING AND CANAL DEPARTMENT  
493 HANOVER AVENUE  
ALLENTOWN, PENNSYLVANIA

*Lehigh Coal - NCW*

Dr. Phillip L. Merritt, Asst. Director  
ATOMIC ENERGY COMMISSION  
P. O. Box 30  
Ansonia Station  
New York City, N.Y.

Dear Dr. Merritt:

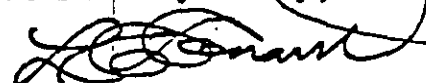
You no doubt know that as the result of the cooperation of your good people we have decided to carry out further explorations for uranium in the vicinity of Mauch Chunk, Pennsylvania.

We expect at this time to spend somewhere between \$30,000. and \$50,000. on this work.

We hope that we will have enough worth while ore to sell one, or more, carloads to your Commission.

In order to determine what freight rates we will have to pay I would like to be advised, as soon as possible, to what point such shipments would be made, and what rates the Commission would pay for the ore. In other words, would the rates paid for the ore in the western part of the United States also apply to our ore?

Yours very truly,



Corporate Engineer  
and Real Estate Agent.

OFFICIAL FILE COPY  
RETURN TO MAIL AND RECORDS

*Copy sent to JCT Johnson 3/13/53*

TO FILE

MAR 16 1953

*UAC-2*

MARCH 13 1953

Jesse C. Johnson, Director  
Division of Raw Materials, Washington

Thomas E. Gillingham, Chief, Physical Exploration Section  
Division of Raw Materials, New York

LEHIGH COAL AND NAVIGATION COMPANY'S MAUCH CHUNK, PENNSYLVANIA,  
URANIUM DEPOSIT—QUESTIONS RELATING TO MARKETING OF ORE FROM

SYMBOL: RMP:TEG:gtr

REFERENCES: (a) Ltr. L. C. Conant, (Lehigh Coal & Navigation Co.) to P. L. Merritt,  
dated 3-2-53  
(b) RMO 918 dated 5-52  
(c) RMO 5 dated 11-52

In reference (a) copy attached, Mr. Conant asks several questions about shipping and selling price of carload lots of ore that may be produced from subject property as a result of exploration work now underway.

As you know, we have been following Lehigh's work very closely. Reg Edmonds has written two reports on the property, references (b) and (c), in the latter of which he suggested the underground work now being done. So far, no more than a few tons of ore have been proved; the grade is generally not over 0.10%  $U_3O_8$ ; but there is the chance that a carload or more of ore grade material may be obtained from current exploration.

Were it not for certain circumstances at the property, I should say that Mr. Conant's questions are a bit premature. But it so happens that the only feasible points of access to the Lehigh deposit lie along a steep embankment with a highway at one elevation and several tracks of the Lehigh Valley Railroad at a lower elevation. Only the barest minimum space is available for a portal; there is no stockpiling area closer than several miles away. Consequently, all material from the planned adit at the highway level, whether it be waste or ore, will have to be hauled some distance by truck.

The grade of any ore likely to come from this property will be too low grade to justify double handling beyond the portal, at this time. Therefore, any ore should be loaded from the truck directly to railroad cars.

OFFICE		RMP	RM		
SURNAME	3/13/53	Gillingham	Nininger	Edmonds	Wetzel
DATE					

Assuming a possible grade of about 0.15%  $H_2O_2$  for earload lots, it appears that we should consider purchasing such lots of ore f.o.b. rail at Manch Chunk, Pa., for possible shipment to Fernald, Ohio, which plant, I understand from NYCO, may be able to handle this sort of material.

Anything that we can do to encourage Lehigh Coal and Navigation Co., will be worth-while. The company is spending a considerable amount of its own funds and has been very cooperative. Recent airborne work in the area has shown several anomalies, which, follow-up crews say, are due partly to extensions to the westward of the formations or structural conditions disclosed in subject property.

In our reply to Mr. Conant, copy attached, we have advised him that his questions having to do with marketing of ores have been referred to your office for answers.

cc: DRM RF

Enclosures:

1. Ref. (a)

2. Ltr TEG/LCConant dtd 3/13/53

## Office Memorandum • UNITED STATES GOVERNMENT

TO: Phillip L. Merritt, Asst. Director  
Division of Raw Materials, New York

DATE: APRIL 28 1952

FROM: R. W. Edmonds, Mining Engineer  
Division of Raw Materials, New York

DRM  
INITIAL  
RDN  
HLLA  
MMA

SUBJECT: VISIT OF LEHIGH COAL AND NAVIGATION CO. OFFICIALS RE: MAUCH CHUNK  
URANIUM DEPOSITS.

SYMBOL: RMS:RWE:ml

MATERIALS 2-7

On the morning of April 22, 1952 the following officials of the Lehigh Coal and Navigation Company called at the New York office, Division of Raw Materials, Atomic Energy Commission to discuss matters pertaining to their uranium property located near Mauch Chunk, Carbon County, Pennsylvania.

Mr. Bruce Smith, Director

Mr. Luther C. Conant, Corporate Engineer and Real Estate Agent

Mr. John Adams, First Assistant Engineer

Mr. Bruce Smith is a New York City stockbroker and represents the majority of the stockholders of the Lehigh Coal and Navigation Co. Mr. Smith learned that members of the Division of Raw Materials New York staff had visited Mauch Chunk recently and he called our office on April 21, 1952 and requested that we inform him of the results of our investigations. As Mr. Smith was not known to us, we communicated by phone with Mr. Adams and he with Mr. Conant who took the matter up with the President of the Lehigh Company. Mr. Conant said that since Mr. Smith was a director of the Lehigh Company the information could not be denied him but requested that we not talk with Mr. Smith prior to the arrival of Messrs. Conant and Adams at our New York office and this was done.

Those present at the April 22, 1952 discussions in addition to the three Lehigh Company officials named above were Messrs. Royal S. Roote, Hans H. Adler and R. W. Edmonds.

Three trips were made to the Mauch Chunk property by members of the New York staff, Division of Raw Materials, during March 1952. A radiometric survey was made of the outcrop and samples taken at

points which registered high readings. The results of the staff investigations will be given in a preliminary report now in preparation.

The significant results of the staff studies are the following:

1. It was found that the highest scintillometer readings along the outcrop were due chiefly to a black uranium mineral disseminated in the matrix or binder of the conglomerate. This is a new development. It was previously thought that the only uranium mineral present in the deposit was carnotite which is exposed along the outcrop in small erratic lenses.
2. The scintillometer survey revealed three zones of high radioactivity. The most consistent zone is near the 1800 foot mark and is about 100 feet in length.
3. Channel samples gave assays of near ore grade and many of the samples had little relation to visible carnotite. Radiometric and chemical assays agree closely which indicates the uranium minerals are in equilibrium. The best zone known at present appears to be near the 1800 foot mark. Assay results indicate a zone 50 feet long averaging 7 feet thick and with a weighted assay of 0.10%  $U_3O_8$ .
4. Scintillometer readings and assay results of samples indicate that the richest portion is near what is described in previous reports as the base of the Pottsville formation. The lower part of the formation is not exposed because of the highway.

Mr. Foote explained the results of the scintillometer survey, Mr. Adler the mineralogic and assay investigation and Mr. Edmonds our present evaluation of the deposits with recommendations for further work.

It was suggested that the Lehigh Coal and Navigation Company blast into outcrop at two or three places near the 1800 foot mark and take bulk samples of each round. A round 6 ft. wide, 6 ft. high and 5 ft. deep was suggested. After each round holes would be drilled in the floor of the adit and material to a depth of about 3 ft. below the road level blasted out from which bulk samples would be taken in order to determine if the material below the road level has a higher uranium content. A tentative estimate of \$2000 was given for the overall cost of the above operations.

Phillip L. Merritt

- 3 -

Mr. Conant said he would take the matter up with the Directors of his company and if approved would contact us. He requested our advice in the matter of taking the bulk samples and we told him we would render such assistance.

~~cc: Jesse C. Johnson~~

# Office Memorandum • UNITED STATES GOVERNMENT

TO : Files (THRU: F. M. Belmore)

DATE: October 23, 1951

FROM : B. M. Robinson, Production Division *BR*

SUBJECT: LEHIGH COAL AND NAVIGATION COMPANY - URANIUM ORE

SYMBOL: PA:BMH:rs

*MATERIALS 2-9 Lehigh*

F. L. Merritt, R. D. Nininger and I met with Messrs. Condit and Adams of subject company on October 19 to discuss the prospective uranium ore mine at Mauch Chunk, Pa. This is a carnotite type ore of low vanadium content and Lehigh has mined 10-12 tons in their exploration which assays 0.4 - 0.5%  $U_3O_8$ . Before continuing development, the company needs an appraisal by the AEC of the property and a statement from the Commission on purchase of ore.

Dr. Merritt discussed the Mauch Chunk property with us several weeks ago and we advanced the thought that ore in small tonnages could be processed at Vitro or the FMPC scrap plant. An alternative would be to employ a simple leach and precipitation process at some nearby plant and ship the concentrate to one of our refineries.

The meeting with the Lehigh Coal and Navigation Co. representatives resulted in the following:

1. D. L. Everhart of Raw Materials will survey the Lehigh property on October 23. A. B. Babcock, Jr. will accompany him and obtain a sample for analysis and experimental work.
2. The sample will be turned over to the Vitro Corp. for leaching and precipitation tests at the Jersey City laboratory.
3. Data from laboratory tests will be used to draft a rough economic evaluation of processing costs.

This combined with prospective shipping charges will serve as a base point for further discussions.

CC: F.L. Merritt, Raw Mtls.  
D.C. Moore, Eng. & Const.  
H.B. Fry, Dep. Mgr.

Files

September 14, 1951

Robert D. Nininger, Deputy Asst. Director  
Division of Raw Materials  
LEHIGH COAL & NAVIGATION COMPANY CARNOTITE PROPERTY AT  
MAUCH CHUNK, PENNSYLVANIA

SYMBOL: RM:RDN:jgw

MATERIALS

✓ - 9 (Lehigh)

I talked to Mr. L. C. Conant, Corporate Engineer for the Lehigh Coal and Navigation Company, on September 13th in connection with what future action they might take in exploring their Mauch Chunk properties. Mr. Conant asked if there was some place where he could ship the 14 tons of material he now has excavated from one of the better carnotite showings.

I told Mr. Conant that there was no place available to treat such a small tonnage of ore at this time and that I thought his problem was to more definitely determine just what might be available in the way of tonnage of acceptable grade. I suggested that the first thing to be done would be to obtain a representative sample of the material excavated and determine the uranium content. On the basis of this information, and considering the information they have already developed they should, with Mr. John Weiss' help (Lehigh University), determine what significance the deposits have and whether there are any opportunities at all for large tonnages.

I also told him that when further information had been developed either we or the Survey would be glad to look at the property again.

It was on the basis of a conversation with George Gallagher in Washington that I stated there was no conveniently located plant at present that could treat such a small tonnage of ore.

OFFICE →	9/14/51	RM					
SURNAME →		Nininger					
DATE →							



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WASHINGTON 25, D. C.

0125400

JUN 13 1951

PRMO  
RECEIVED

Mr. L. C. Conant  
Corporate Engineer and Real Estate Agent  
Lehigh Coal and Navigation Company  
453 Hanover Avenue  
Allentown, Pennsylvania

MATERIALS 2-9- (Lehigh)

Dear Mr. Conant:

Enclosed is a copy of our laboratory report TDC-944 giving the results of analyses of the samples, from your Mauch Chunk locality, that you sent to the Geological Survey as indicated in your letter of April 18 sent to the attention of John C. Rabbitt. The analyses have been made at the request of the Atomic Energy Commission.

As nearly as I can tell from the sketches sent with the copy of your transmittal letter of April 19 all but two of the samples are accounted for. The two that I cannot account for are 5-1-1 and 5-1-2. You will note though that there are two 5-1-1s and two 5-1-2s shown on the analytical report. It is possible that the 1 was confused with a and the 2 with an L. I am asking the laboratory to check the original labels to see if this is the case.

The results reported in the column headed "%  $eU_3O_8$ " represent the measurement of radioactivity expressed in equivalent  $U_3O_8$ . The results in the second column which is headed "%  $U_3O_8$ " are obtained by chemical analysis. I trust that they will be useful to you. I shall be interested to learn what John Keitz's conclusions are after he has a chance to correlate the analyses with his other information. If he has any reserve chips from the samples with higher vanadium content he might find it interesting, though not of any particular economic import, to determine whether there is also a distinct vanadium mineral present.

If you have any questions about the analyses I shall be glad to try to get them answered.

With kind personal regards, I am

Sincerely yours,

Arthur P. Butler, Jr.  
Geologist, Trace Elements Office

cc: P. L. Merritt-AEC, NY  
J. O. Hosted

Enclosure-cc of Rept. No. TDC-944

URNI-1081

FILE COPY  
RETURN TO MAIL & RECORDS

RECEIVED

JUN 17 1951  
NEW YORK OPERATING DIVISION

Geochemistry & Petrology Branch

Report No. TDC-944  
50284

For: Arthur P. Butler, Jr.  
U. S. Geological Survey  
Washington, D. C.

Fifty-five (55) carnotite samples, Lot No. 436, from Mauch Chunk, Pennsylvania, received in Denver Trace Elements Laboratory, May 23, 1951.

Serial No.	Field No.	% $U_3O_8$	% $U_3O_8$	% $Fe_2O_3$	% $CaCO_3$
50250	1-1-a	0.004	0.005	0.03	< 0.1
50251	1-1-b	0.003	0.002	0.02	< 0.1
50252	1-2-a	0.009	0.009	0.28	< 0.1
50253	1-3-a	0.009	0.005	0.12	0.1
50254	2-1-a	0.003	0.005	0.02	< 0.1
50255	2-1-b	0.37	0.44	1.23	< 0.1
50256	2-1-c	0.22	0.22	0.63	< 0.1
50257	2-1-d	0.21	0.17	2.01	< 0.1
50258	2-2-a	0.007	0.002	0.02	< 0.1
50259	2-2-b	0.47	0.58	2.36	0.1
50260	2-2-c	0.43	0.54	3.39	0.1
50261	2-2-d	0.054	0.030	1.02	< 0.1
50262	2-3-a	0.26	0.22	1.83	< 0.1
50263	2-3-b	0.002	0.002	0.02	0.1
50264	2-3-c (1)	0.060	0.041	1.05	< 0.1
50265	2-3-d (2)	0.11	0.11	1.24	< 0.1
50266	2-3-e	0.002	0.001	0.02	< 0.1
50267	3-1-a	0.007	0.008	0.05	< 0.1
50268	3-1-b	0.29	0.35	0.56	< 0.1
50269	3-1-c	0.007	0.004	0.30	0.1
50270	3-2-a	0.002	0.005	0.02	< 0.1
50271	3-2-b	0.056	0.054	0.07	< 0.1
50272	3-2-c	0.21	0.20	0.70	< 0.1
50273	3-2-d	0.074	0.044	0.68	< 0.1
50274	3-2-e	0.030	0.018	0.49	0.2
50275	3-2-f	0.020	0.012	0.15	< 0.1
50276	4-1-a	0.009	0.006	0.05	< 0.1
50277	4-2-b	0.012	0.037	0.49	< 0.1
50278	4-2-c	0.40	0.43	3.98	0.2
50279	4-2-d	0.61	0.87	6.60	0.2

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Serial No.	Field No.	% $^{235}\text{U}$	% $^{238}\text{U}$	% $^{232}\text{Th}$	% $^{230}\text{Th}$
50280	4-2-a	0.010	0.007	0.67	< 0.1
50281	4-3-a	0.005	0.004	0.09	< 0.1
50282	4-3-b	0.70	0.90	3.60	< 0.1
50283	4-3-c	0.010	0.008	0.13	< 0.1
50284	5-1-a	0.10	0.11	0.65	0.1
50285	5-1-b	0.081	0.13	0.09	< 0.1
50286	5-1-c (1)	0.006	0.006	0.19	< 0.1
50287	5-1-c (2)	0.024	0.024	0.07	< 0.1
50288	5-1-d	0.017	0.020	0.37	< 0.1
50289	5-1-e	0.049	0.052	0.73	< 0.1
50290	5-1-f	0.056	0.050	0.55	0.7
50291	5-1-g	3.0	3.11	0.23	3.8
50292	5-1-h	1.4	1.47	2.08	1.9
50293	5-1-i	0.19	0.17	0.05	0.2
50294	5-1-j (1)	0.41	0.51	0.14	< 0.1
50295	5-1-k (2)	0.59	0.49	0.09	< 0.1
50296	5-1-l	0.004	0.002	0.051	< 0.1
50297	5-2-a	0.006	0.005	0.09	< 0.1
50298	5-2-b	0.10	0.10	0.12	< 0.1
50299	5-2-c	0.11	0.083	0.07	< 0.1
50300	5-2-d	0.061	0.052	0.07	0.1
50301	5-2-e	0.33	0.21	0.05	< 0.1
50302	5-2-f	0.058	0.040	0.07	0.1
50303	5-2-g	1.3	1.30	0.30	2.4
50304	5-2-h	0.006	0.002	0.07	0.1

By: Radiation - Furman

Chemistry - Boyes, Dufour, Hoffman, Wahlberg

*Lewis F. Rader, Jr.*

Lewis F. Rader, Jr., Chief  
Denver Trade Elements Laboratory

Date: June 5, 1951

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